

AR78

ENDAKO MINES LTD. FIRST ANNUAL REPORT 1963

J. Scott
AUG 12 1963



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AR78

Draper Dohe & COMPANY LTD.



(EST. 1923). MEMBERS: THE TORONTO STOCK EXCHANGE
CANADIAN STOCK EXCHANGE

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WINDSOR - SUBURY - NORTH BAY - ST. CATHARINES - TIMMINS - BRAMPTON - ROYIN

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ENDAKO MINES LTD.

Jan. 1968

HIGHLIGHTS

1. Management is excellent. Controlled by Canadian Exploration Ltd., wholly owned subsidiary of Placer Development Ltd.
2. Reserves are adequate for 19.5 years of operation.
3. Capacity increase to 22,000 t.p.d. will become effective early in 1968.
4. Company is free of capital indebtedness. Bank loan should be retired in 1968.
5. Initial dividend could be paid in 1968.
6. Operates under long term sales contracts.
7. Expanded production will be primarily in the form of Molybdc oxide, which commands a higher market price.
8. Company is second largest producer of molybdenum in the free world.

COMPANY

Owns a producing molybdenum mine in the Endako area of British Columbia. Property consists of 204 claims and is equipped with concentrator which commenced operation in mid May, 1965, at a rate of 10,000 t.p.d. Capacity was increased to 16,000 t.p.d. and a further increase to 22,000 t.p.d. and is scheduled to be fully operational by January 1, 1968.

Production at the 22,000 t.p.d. rate will enable company to maintain a minimum rate of 12 million pounds of molybdenum per year.

The bulk of the production is sold under long term contract to Japanese and European buyers, approximately 30% of the production is wasted to Molybdc oxide which commands a higher price.

Production is from open pit mining.

Company is controlled by Canadian Exploration Company (a wholly owned subsidiary of Placer Development Ltd., which holds 82.26% of the issued capital.

ORE RESERVES

The increase in capacity to 22,000 t.p.d. will allow lower grade material to be profitably processed and as a result the cut-off grade has been reduced to 0.08% MoS₂.

Using this figure ore reserves are estimated at 153,628,000 tons grading 0.155% MoS₂.

At a rate of 22,000 tons per day the reserves will maintain the operation for approximately 19.5 years.

OUTLOOK

On June 15, 1967, the balance of the term bank loans were repaid and the \$5 million 6% redeemable preference shares were redeemed. The latter out of proceeds from a bank loan, but at current rate of earnings this should be retired by early 1968.

Mr. Scott

Earnings currently running at approximately \$1.50 per share per year should be further increased in 1968 when the additional capacity is fully utilized.

It is not anticipated the rate will be increased beyond the 22,000 t.p.d. rate but that earnings will increase the operation becomes more routine and efficient.

The three year tax exempt period will end at July 31, 1968. The company thus will be in a taxable bracket for the second half of the year. Taxes will not be an important consideration for some years due to the large write offs available.

PRODUCTION

In the 9 months period ending Sept. 30, 1967, treated 17,750 t.p.d. for a production value of \$19,426,000, and an operating profit before write offs of \$11,555,000 or \$1.49 per share. Net profit was reported at \$8,908,000 or \$1.15 per share. For 1968 operating profit is estimated at \$2.05 per share before write offs. Net profit is estimated at \$1.50 per share.

DIVIDENDS

No dividends have been paid to date. It is anticipated an initial dividend could be paid in 1968. While it is still premature to estimate the payment, it could be as high as \$1.00 annually. This would provide a high rate of return to Canadian Exploration, which holds a very large interest, and thus to Placer Development Ltd.

CONCLUSION

Company has adequate reserves for many years and will be entirely free of debt within the tax-free period. Capital indebtedness has been retired during a heavy expansion from 10,000 t.p.d. to 22,000 t.p.d., indicative of the earning capacity of the operation. While the expansion of production facilities have permitted the inclusion of lower material in ore reserve calculations, and thus lowered the reported reserve grade, mill heads will probably be well above reserve figures for some years. This will result in higher than average earnings for the near term.

In future mill heads will more closely approach the reserve figure and profit per ton will decline slightly. Taxes will also be applicable and effect the net profit. Earnings at this time are expected to be in the \$1.15-1.25 range.

STATISTICS

	<u>9 mos. 1967</u>	<u>8 mos. to Dec. 31/66</u>	<u>9 mos. to Apr. 30/66</u>
Production	\$19,426,000	\$15,995,081	\$15,942,402
Operation Costs	7,871,000	6,061,743	5,437,822
Operation Profit	11,555,000	9,930,333	10,504,580
Interest Income	14,000	6,811	6,652
<u>Less</u> Depreciation	1,467,000	1,305,000	1,293,003
Prep. Exp. W.O.	896,000	794,344	896,639
Interest Chgs.	298,000	385,341	650,813
Net Profit	8,908,000	7,541,864	7,650,777
Net per share	1.15	0.94	0.92

Note: At start of production in mid-May, 1965, fiscal year ended at April 30th fiscal year changed in 1966 to end at December 31st.

Corporate Structure — at December 31, 1966

Authorized

Issued

Outstanding

Preference Stock, 6% cum. R.D. \$1 p.v.
Common Stock, n.p.v.

5,000,000

5,000,000

5,000,000*

* Preference stock was redeemed in full on June 15, 1967. Funds provided by bank loan.

10,000,000

7,750,007

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The information contained herein, while not guaranteed, has been obtained from sources we believe to be reliable.

ENDAKO MINES LTD. (N.P.L.)



DIRECTORS:

J. Douglas Little	Vancouver, B.C.
John P. Roberts	Vancouver, B.C.
Andrew Robertson	Vancouver, B.C.
Edgar A. Scholz	Vancouver, B.C.
Isaac Shulman	Vancouver, B.C.

OFFICERS:

Andrew Robertson	President
James L. McPherson	Secretary
John R. Croll	Treasurer

REGISTRAR AND TRANSFER AGENT:

Guaranty Trust Company of Canada,
Vancouver, B.C.

AUDITORS:

Thorne, Mulholland, Howson & McPherson,
Vancouver, B.C.

CONSULTING ENGINEERS:

Chapman, Wood & Griswold Ltd.,
Vancouver, B.C.

BANKERS:

Royal Bank of Canada,
Vancouver, B.C.



REPORT OF THE DIRECTORS

It is gratifying to your Directors to submit as your Company's first Annual Report the financial and engineering statements which follow. We commend them for your study as comprising what we consider to be a most propitious first-year development record.

Included are Financial Statements, the Auditor's Report and the Progress Report of your Company's consulting engineers, all covering the year which ended April 30, 1963.

Also included as supplementary information of interest to Shareholders is a brief word-and-picture history of your Company's Stella Mine Property. It shows that the Stella - though echoing only now to intensive exploration and development - was part of the first British Columbia area explored more than 150 years ago.

While the financial and engineering statements which form part of this report are both comprehensive and self-explanatory, your Directors feel that some comment on their significance is in order.

FINANCIAL

Your Company's financial statements reflect particularly the favourable operating contract entered into on September 1, 1962 and amended January 18, 1963, between your Company and Canadian Exploration Limited under which that Company provides the funds for both development and production.

Thus, despite the intensive exploration and development work carried out up to April 30, 1963, and continued since then, the cash position of your Company as shown in the balance sheet remains adequate for all foreseeable costs of administration and other commitments. These commitments include your Company's undertaking to spend \$15,000 on each of the adjacent Tormont and Utica option properties during the year.

DEVELOPMENT AND ORE RESERVES

The diamond drilling program initiated by your Company has been continued under the very able



management of Canadian Exploration Limited. That Company has not hesitated to improve procedures and expand the scope of operations as drilling results warranted. Exploration to date has been confined to the mineralized zone within 500 feet of the surface.

The report presented by your Company's Consulting Engineers, Chapman Wood & Griswold Ltd., outlines the development to the fiscal year end and presents the ore position in detail. The first year of development has been encouraging in that it indicated a tonnage in excess of 70,000,000 tons of significant molybdenite mineralization above five hundred feet from which selective open pit mining can derive a large tonnage of ore that will enable an attractive operating profit to be made. As recommended by the Consulting Engineers, confirmation of ore grade by bulk sampling is planned.

MARKETING

Shareholders will be interested in the latest

figures available on production and consumption of Molybdenum which indicate a growing market.

"The Engineering and Mining Journal" shows that, in 1961, Free World production of Molybdenum concentrate fell short of meeting demand. Production totalled 73,000,000 pounds, whereas consumption was 75,000,000 pounds.

A steady increase in Molybdenum consumption outside and inside the United States, added to an increasing number of new uses, for molybdenite in lubricants and molybdenum in missile equipment, indicates an expanding demand.

ACKNOWLEDGEMENTS

The Board wishes to express its appreciation of the services rendered by the employees of Canadian Exploration Limited and by the Company employees who initiated the operation.

On Behalf of the Board of Directors,

Andrew Robertson, President.

Vancouver, B.C., July 17, 1963



THE ENDAKO (STELLA MINE) STORY, 1806 – 1963

The British Columbia area in which Endako is located was first explored 52 years before the province's historic gold rush – 52 years before Queen Victoria proclaimed the Colony of British Columbia.

And, as is the case with most of the Canadian West, the Endako area's early history is told in the journals of early Nineteenth Century fur-traders.

It goes back to 1806 – two years before Simon Fraser was to make his memorable voyage to the mouth of the river that bears his name. That year, one of Fraser's aides did a little exploring on his own. His name was John Stuart, one of the traders sent out with Fraser by the North-West Company to blaze an overland route into the rich fur-trapping area of the Pacific Coast.

Setting out from the junction of the Nechako and Fraser Rivers, near the present City of Prince George, Stuart travelled up the Nechako to a scenic lake which he promptly named Fraser Lake, after his rugged chief. The same year, Fraser himself visited the lake and established on its banks a new fur-trading post, Fort Fraser, in the name of the North-West Company.

Thus, not far from Endako, Fort Fraser came into existence 157 years ago – 82 years before there was a City of Vancouver.

John Stuart's choice of route to the Pacific Ocean proved, more than a century later, to be a sound one. The Grand Trunk Pacific Railway, now part of

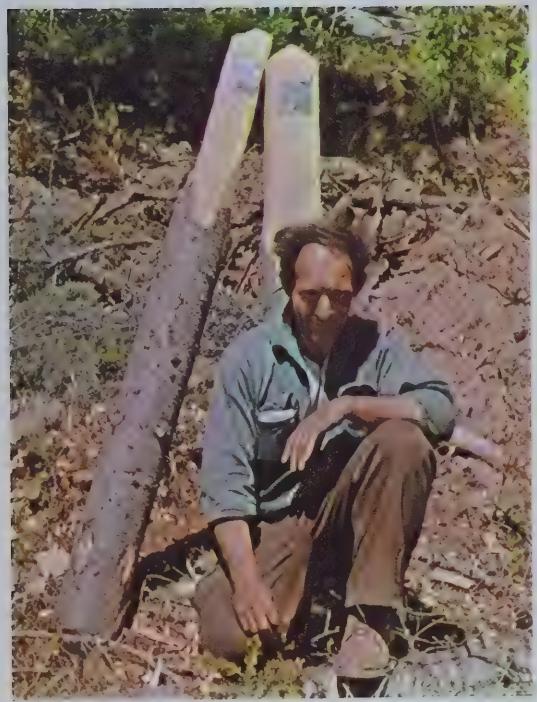
the Canadian National system, pushed through the same Fort Fraser en route from Edmonton on the Prairies to Prince Rupert on the Pacific Coast. Later the Provincial highway followed the same general route.

As settlers followed the railroad, a village sprung up on the western end of the lake which John Stuart discovered. It was located near where the Endako River enters the lake, and was given the name Fraser Lake. Among the village's early residents were two men, Charles H. Foote and Alf Langdon, who were to become the first white men to stumble on the molybdenite ore on which Endako's future is staked.

That was in 1927. Foote and Langdon had set out deer-hunting west from the lake. As they hunted the lightly-wooded, rolling hills lying between the Endako River and Francois Lake, six miles to the south, they were attracted by the numerous pieces of richly-mineralized float scattered along the crest of the ridge.

They discovered the ore in place and staked the claims which they called the Stella Mine.

During the early years of their tenure, Foote and Langdon prospected their claim by making trenches and pits in the vicinity of the molybdenite mineralized float, by sinking a shaft 27 feet on a two-foot quartz molybdenite vein. A short adit was driven in the north bank of a shallow ravine below the shaft. (The showings and workings are described in the



Claim location posts



Engineer examining broken ore



Surface Trench



B.C. Department of Mines Bulletin No. 9, 1940, by John S. Stevenson. The regional geology is described in Memoir 252, The Geological Survey of Canada, by J. E. Armstrong, 1959.)

Over the years, the Stella property was examined for various individuals and companies. Following lapse of the original claims in 1959, they were re-staked by Dr. C. H. Riley and associates. In October and November, 1960, Dr. Riley had the claims mapped and the numerous occurrences of float noted. He also had a bulldozer do some stripping in the vicinity of the original trenches.

In July, 1961, Dr. Riley interested mining engineer Andrew Robertson in the Stella molybdenite prospect. Robertson, with extensive production experience in Eastern Canada before returning to his native province of British Columbia, first examined the property in company with Dr. Riley on July 19, 1961.

Encouraged by this first examination, he obtained a three-week examining option to clear the bulldozed area to bedrock. It was found necessary to drill and blast the rock, in order to assess the mineral content. Seven rock trenches were cut in the stripped area and the information so gained, while not conclusive, strongly indicated a major ore structure.

Robertson negotiated a purchase agreement with Dr. Riley and proceeded to stake open ground

to the south and east, adjoining the 26 original Stella claims. His faith was not shared by his eastern associates, however, and the agreement lapsed in November, 1961.

In January, 1962, on behalf of his own company, R. & P. Metals Corporation Ltd., Robertson finalized a new agreement for purchase of the Stella claims. Four months later a diamond drill program was started, as recommended by geologist S. Waisberg and engineer Vic Bjorkman. On May 28, 1962, the first drill hole No. S-1 was at 100 feet depth on the Stella Jay 10 claim. By June 18, the fourth hole was drilling and news of encouraging results spread across Canada.

Endako Mines Ltd. (N.P.L.) was incorporated as a private company on June 21, 1962. On August 10, following acceptance of the prospectus by the Superintendent of Brokers at Victoria, B.C., it became a public company. Trimart Investments Ltd. of Toronto became underwriters, providing the funds for continued development.

By late August, 1962, the ninth hole had been completed and a second diamond drill was on the job. By then, Canadian Exploration Limited (Canex) had expressed interest in the property and Canex personnel visited the Stella project on August 22.

Following this examination, Canadian Exploration Limited entered into a participation arrangement with Endako Mines Ltd. (N.P.L.), which was



Setting up driller's camp



AX diamond drill rig



Cookhouse . . .



Core from first diamond drill hole



Francois Lake



Geologists examining core



Core library



Wire line NX drill



Highgrade molybdenite

set forth in a memorandum dated August 28, 1962. This memorandum defined terms under which the property would be financed through to production, provided that the development program indicated such investment to be justifiable. The actual agreement was signed on September 13, 1962.

Canex financed development after September 1, and on October 13, 1962, assumed full management control.

Up to that time, 17 holes producing AXT-size core had been drilled to an average depth of 500 feet. Molybdenite mineralization was encountered in every hole, distributed over the total length of the core, so that all core recovered from the top to the bottom of each hole had to be split and assayed.

A third drill was added in October, and by December 22, 1962, when work was suspended for year-end holidays, a total of 52 drill holes were completed.

On January 18, 1963, by an amended agreement, Endako acquired 152 additional mineral claims from Robertson, for the cost of staking. These, principally, adjoined the Stella claims to the north, extending as far as the railway.

Endako at this time also concluded agreements with Tormont Mines Limited and Utica Mines Ltd. (N.P.L.). These agreements provide for the development of their properties adjoining Endako on the east and west respectively in return for a 75% participation in the profits from production after the

costs of bringing them into production have been recovered.

Prior to and during the year-end holiday shutdown, methods of improving drilling procedure were sought in order to obtain the highest possible core recovery. It was decided to convert to wireline equipped diamond drills, producing BX size core, and these were introduced when work resumed.

From that time to April 30, excellent core recovery has been experienced in 26 holes drilled, and sludge samples recovered with mechanical sample-splitters have afforded close assay checks on the core.

Much of the drilling has been exploratory, with holes spaced 800 feet apart. This program has shown mineralization extending over a length of 6,400 feet and across a width of more than 2,000 feet. Lateral and depth limits have not yet been fully defined. Latest drilling has been concentrated on filling in the gaps in the more favourably mineralized part of the zone.

The firm of Chapman, Wood & Griswold Ltd., Consulting Engineers and Geologists, was retained by Endako in November, 1962, to report and advise on the ore development. Their reports have, from time to time, given details of the progress made, together with calculations of the ore position.

Their latest submission, covering progress to April 30, 1963, forms part of this report.

**STATEMENT OF EXPLORATION AND DEVELOPMENT EXPENSES
FOR THE PERIOD FROM INCORPORATION ON JUNE 21, 1962 TO APRIL 30, 1963**

Diamond drilling.....	\$245,326
Engineering, contracting and equipment rentals.....	27,322
Field expenses and supplies.....	55,093
Salaries, wages and employee benefits.....	47,717
Travelling and supervision.....	10,912
Legal fees.....	36,251
Office and administration.....	20,164
	<u>\$442,785</u>

NOTES TO BALANCE SHEET AS AT APRIL 30, 1963

1. By an agreement dated September 1, 1962, as amended January 18, 1963, Canadian Exploration Limited ("Canex") agreed to carry out a programme of exploration and development on the property of Endako Mines Ltd. (N.P.L.) ("Endako"). Under the terms of the agreement Canex undertook to spend a total of \$150,000 by January 31, 1963 and, for the first \$75,000 of such expenditure, Endako agreed to allot to Canex fully paid and non-assessable shares at the rate of one share for each \$1 expended. The agreement further provides that for a two year period commencing January 31, 1963 Canex has the right to continue exploration and development, requiring expenditure at the rate of a minimum of \$400,000 per year, subject always to the right to terminate on sixty days' notice, and that, prior to January 31, 1965, it may give notice of intent to equip Endako's property for production. Upon the equipping of the property for production Endako will repay to Canex all monies expended by Canex or procured to be advanced by Canex for exploration and development or for equipping the property for production, together with interest at the rate of 6% per annum, out of eighty per cent of the cash flow of the operation of the property. In addition, upon equipping the property for production Canex shall be entitled to receive from Endako, without further consideration, shares of Endako as follows:

- (i) To the extent of 60% of the total issued shares of common stock of Endako if the monies expended or procured to be advanced by Canex to that time do not exceed \$15,000,000.
- (ii) To the extent of 65% of the total issued shares of common stock of Endako if the monies expended or procured to be advanced by Canex to that time amount to more than \$15,000,000 but less than \$20,000,000.
- (iii) To the extent of 70% of the total issued shares of common stock of Endako if the monies ex-

pended or procured to be advanced by Canex to that time amount to more than \$20,000,000.

The initial 75,000 shares previously referred to above shall be included in computing the above percentages.

As at January 31, 1963 Canex had made total expenditures of \$209,607 and, for the first \$75,000 of such expenditures Endako issued to Canex 75,000 shares. Canex has given notice of its intention to continue exploration and development as called for under the terms of the agreement and between January 31 and April 30, 1963 had made additional expenditures of \$127,418.

2. Under terms of escrow agreements dated August 3 and November 15, 1962 1,200,000 shares of the issued capital of Endako at April 30, 1963 have been deposited in escrow with the Guaranty Trust Company of Canada. Except with the written consent of the Securities Commission of the Province of British Columbia the holders of 1,125,000 shares shall not sell, deal in, assign or transfer in any manner whatsoever these shares. The balance of 75,000 shares, referred to in Note 1, are to remain in escrow until such time as notice has been given by Canex of its intention to equip Endako's property for production.

3. Endako has resolved to increase its authorized share capital from 5,000,000 shares without nominal or par value to 10,000,000 shares without nominal or par value, such increase not to be implemented until required under the terms of the agreement referred to in Note 1.

4. By agreements dated January 18, 1963 between Endako and Tormont Mines Limited and Endako and Utica Mines Ltd. (N.P.L.) Endako has undertaken to spend \$15,000 on the properties of each of these companies before July 31, 1963 and November 1, 1963 respectively.

PROGRESS REPORT

PURPOSE AND SCOPE

At the request of Mr. Andrew Robertson, President, Endako Mines Ltd. we have prepared this Progress Report summarizing results of exploration during the year ending April 30, 1963 on the Stella molybdenite deposit near Endako, B.C.

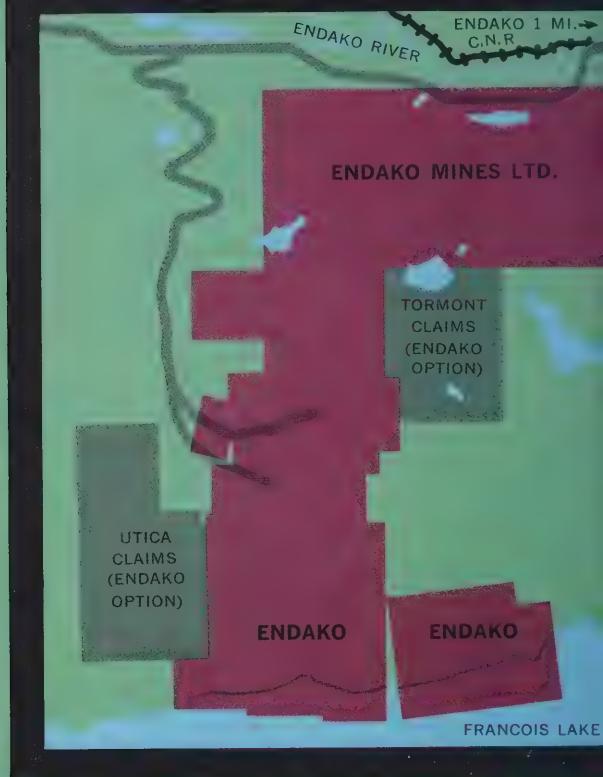
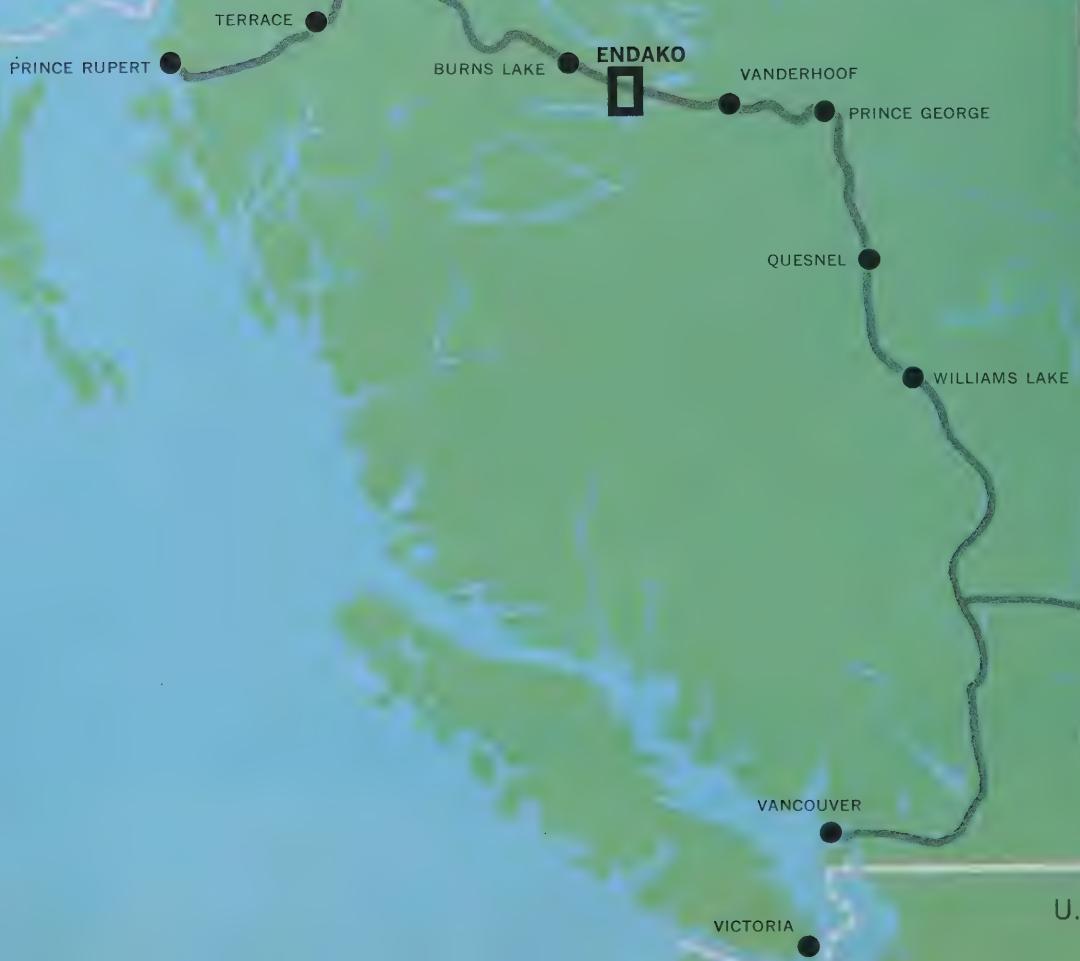
A brief review of exploration accomplished during the year is presented. Substance of the report, however, is our estimation of molybdenum reserves based on evaluation of drill hole results from all holes up to and including S-79.

We have not included any of the following subjects which we have previously discussed in our Report of Examination dated November 28, 1962; and Evaluation Report dated March 1, 1963:

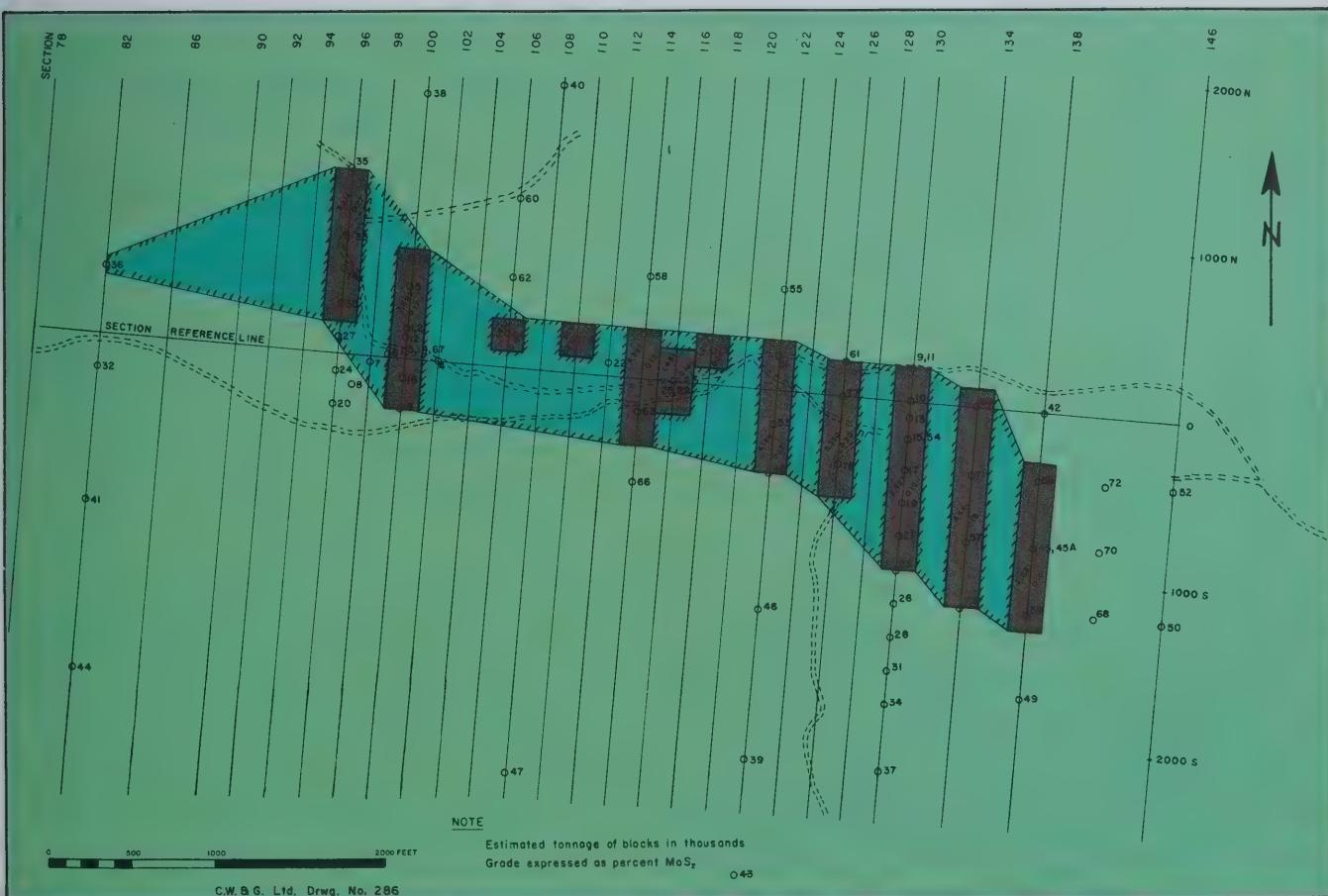
Properties	Geology and Mineralogy
Topography	Metallurgy
Water Supply	Markets
Power and Fuel	Economic Analysis

The background upon which we have prepared the current estimate of reserves includes examination of the properties on November 20 and 21, 1963; review of all drill hole logs, assay data, geologic maps; discussions with key personnel of Canadian Exploration Limited, operator of the project; and discussions with the field supervisor of Endako Mines Ltd.

B R I T I S H C O L U M B I A



U.S.A.



ENDAKO MINES LTD., PLAN OF MOLYBDENUM RESERVES AS OF APRIL 30, 1963

- SURFACE DIAMOND DRILL HOLE

POSSIBLE RESERVES

 GEOLOGICALLY INFERRED RESERVES

CONCLUSIONS & RECOMMENDATIONS

A. Results of exploration on the Stella molybdenite deposit during the year ending April 30, 1963 indicate the existence of a low grade multimillion ton deposit of economic significance.

B. An estimate of reserves has been prepared using core assay values from 80 diamond drill holes totaling 40,027.5 feet of drilling. These reserves are classified as follows:

Category	Tons Grade A (ore)	% MoS ₂	Tons Grade B (sub-marginal)	% MoS ₂	TONS TOTAL	% MoS ₂
Possible	18,000,000	.25	18,000,000	.12	36,000,000	.19
Geologically Inferred	18,000,000	.25	18,000,000	.12	36,000,000	.185
	36,000,000	.25	36,000,000	.12	72,000,000	.19

C. Economic analysis of extraction by essentially non-selective open pit mining demonstrates that at a milling rate of 13,000 tons per day profitability is established at a grade of .19% MoS₂. However, on a present value basis, using an adaptation of Hoskold's formula with 10% risk and 3% safe interest rates, the investment is not attractive.

D. On the other hand application of selective open pit mining methods employing controlled upgrading indicates higher profitability at a lower rate of extraction and with approximately 20% less capital required.

At a grade of .25% MoS₂ and a milling rate of 10,000 tons per day the estimated capital investment of \$30,000,000 should be returned by end of the 4th operating year.

Under this plan sub-marginal material would be moved to stockpile for blending or possible future treatment by improved process methods.

Total reserves required at .25 grade would be in the range of 45,000,000 to 50,000,000 tons.

The target orebody as presently delineated is approaching this magnitude.

E. On the basis of preliminary studies it is estimated that within the approximate limits of the deposits as now defined the material ratios will be:

Waste - 2 Sub-marginal - 1 Ore - 1

F. Marked improvement in core recovery and drilling procedure during the latter part of the current program has increased considerably the confidence with which core assays can be interpreted. However, in the overall evaluation core assay values are considered to be slightly lower than the true molybdenum content of the deposit.

Conversely the sludge assay values are believed to be disproportionately high. For this reason we have completely disregarded sludge assays in our estimates of reserves.

G. It is our opinion that drill exploration has reached the point at which sufficient tonnage is indicated to sustain a substantial operation provided that the grade inferred from drill hole results can be confirmed or improved by a valid correlation with the actual grade of material in place. At this stage establishment of the true molybdenum content of the deposit is of far greater importance than increasing the reserves. For this reason we recommend that drill exploration be curtailed for the present and that a program of bulk sampling be undertaken as soon as possible. While such sampling could be accomplished by driving underground openings from shafts and adits, it is our opinion that more information at less cost could be obtained from surface cuts. A careful study of the drill hole sections suggests that the top of the mineralized body should be reasonably representative of the reserves delineated to date. Surface cuts along typical portions of Sections 10,0E and 13,0E to a depth of approximately 50 feet would permit precise checking of blocks of ore, sub-marginal and waste material delineated by two typical series of drill holes.

Decisions relating to additional drill exploration, and development of the deposit will obviously rest heavily on results of the bulk sampling operation.

Respectfully submitted,

CHAPMAN, WOOD & GRISWOLD LTD.

E. P. Chapman, Jr.

John A. Wood

SUMMARY OF EXPLORATION

Exploration during the year ending April 30, 1963 was confined almost entirely to the area of principal molybdenum mineralization known as the Stella deposit.

Work consisted chiefly of diamond drilling, but also included geologic mapping, soil sampling and some bulldozer trenching.

80 exploratory holes totalling 40,027.5 feet were drilled from surface locations, and penetrated the deposit to an average depth of 400 to 500 feet.

Between May 27 and October 13, 1962 and prior to assumption of full managerial control by Canadian Exploration Limited, Endako Mines drilled 17 holes totalling 9,633.5 feet, recovering AXT core.

Subsequent to October 13, 1962 63 additional holes (including 45-A) totalling 30,394 feet were drilled under Canex Management.

Great emphasis has been placed on improvement of drilling procedure in order to obtain the highest possible core recovery. After experimenting with BX and BXF with conventional drilling ma-

chines, the operation was completely converted to wire-line equipment with which were drilled the last 13,239 feet (holes 53-79). Use of wire line resulted in raising core recovery to the range of 90 percent as compared with previous variable and unpredictable recoveries averaging 50 to 60 percent.

Much emphasis has also been placed on sampling and assaying procedures and exceptionally high standards of performance are being observed in order to lay a foundation for the best possible correlation between core, sludge and true molybdenum values.

A soil sampling survey was run over a broad area including the zone of apparent principal molybdenum mineralization.

A number of bulldozer trenches were cut transversely across the trend of the deposit to assist in mapping and interpretation of structural and lithologic features.

Additional diamond drilling was scheduled for completion subsequent to April 30, 1963.

RESERVES

It is our opinion that diamond drill exploration has progressed to the point at which a formal classification of reserves may be applied.

An estimate of reserves as of April 30, 1963 is submitted herein and is based on evaluation of core assays of all drill holes through number S-79.

The controls applied to the current estimate are enumerated:

A. CLASSIFICATION

1. Possible Reserves are divided into two classes based on length of influence of drill hole control:

Class I - drill hole control with 100 feet.

Class II - drill hole control more than 100, but not over 200 feet.

There are a few minor deviations from the rigidity of these controls in cases where drill hole spacing does not precisely conform to the mathematical interval, or where angle holes may exert considerable influence, or where a combination of angle and vertical holes may complicate construction of the ore, sub-marginal, or waste blocks being measured.

Material blocks have been constructed along drill section lines numbered in reference to a controlling base line. These blocks in most cases have their long dimension along strike of the drill sections and transverse to apparent strike of the deposit. Depth is measured in a vertical plane and width in all cases is 200 feet along strike of the deposit (100 feet either side of the drill section plane).

2. Geologically Inferred Reserves.

There is no designation as to class.

These are reserves lying between and around drill hole sections controlling Possible Reserves and within the principal zone of significant molybdenum mineralization as outlined on Drwg. No. 286.

They are inferred to be present on the basis of apparent trends of metal distribution, proximity to random drill holes, and a general level of confidence established by statistics from all holes drilled to date.

The area of these reserves is equal to twice the area occupied by material in the Possible category.

We have rather arbitrarily assumed that one-half the volume of this zone will contain material having metal content and distribution roughly similar to that of the Possible blocks. Thus the total of Geologically Inferred Reserves is equal to that of Possible Reserves.

This estimate is considered to be reasonably conservative.

B. GRADE

Grade classifications were determined on the basis of selective open pit mining which would incorporate closely controlled upgrading by removal of waste and sub-marginal material separately from that of a grade which can be treated profitably.

Grade A is .20% MoS₂ or better and is classed as ore.

Grade B is .10 to .19% MoS₂ and is classed as sub-marginal. It is proposed that material in this grade would be moved to stockpile for blending or possibly re-claiming at a future date in event a low cost process might be developed for it.

Waste is material grading less than .10% MoS₂.

The grade of individual material blocks was established by calculating weighted averages of assays along drill hole mineral intercepts. The minimum interval used in block construction was 30 feet of drill hole length.

C. DENSITY FACTOR

Tonnages for all categories of materials were calculated by using a density factor of 12.5 cubic feet per ton in place.

In estimating material ratios no distinction was made between alluvium and rock in place since it is anticipated that 1 in-bank yard of alluvium can be excavated and moved for approximately the same cost as that for 1 ton of rock in place.

D. CONTROLS APPLICABLE TO ECONOMIC ANALYSIS

Milling reserve required	47,000,000 tons
Milling rate - 10,000 T/day =	3,600,000 T/yr.
Grade - % MoS ₂	0.25
Metallurgical loss - %	20
Lbs. recoverable MoS ₂ per ton	4.00
Concentrate sales price/lb.	
MoS ₂ - \$ Canadian	\$0.84
Net realization/ton milled	\$3.36
Operating profit/ton milled	\$1.33
Operating costs/ton milled	\$2.03
Operating life, years	13
Materials ratios: waste - 2, sub-marginal - 1, ore - 1.	

Summary of reserves follows in TABLE I. Details of calculations appear in Appendix. Calculation of materials ratio appears in TABLE II.

TABLE I – SUMMARY OF RESERVES

As of April 30, 1963

POSSIBLE RESERVES

Section	Tons Class IA	Grade MoS ₂ %	Tons Class IB	Grade MoS ₂ %	Tons Class IIA	Grade MoS ₂ %	Tons Class IIB	Grade MoS ₂ %	TOTAL Tons	Grade MoS ₂ %
9,6E	1,568,000	.37	1,138,000	.11	224,000	.65	384,000	.10	3,314,000	.27
10,0E	1,138,000	.29	2,445,000	.11			316,000	.10	3,899,000	.17
10,6E	1,056,000	.24	576,000	.10					1,632,000	.19
11,0E	128,000	.71	736,000	.14					864,000	.22
11,4E	838,000	.22	1,443,000	.11	825,000	.22	1,291,000	.11	4,397,000	.15
11,6E	306,000	.22	807,000	.13	170,000	.22	168,000	.12	1,451,000	.16
11,8E	1,248,000	.26							1,248,000	.26
12,2E	1,118,000	.23	1,710,000	.13	541,000	.24	775,000	.12	4,144,000	.17
12,6E	2,882,000	.21	292,000	.11	2,120,000	.21	56,000	.11	5,350,000	.20
13,0E	1,223,000	.23	1,704,000	.14					2,927,000	.18
13,4E	1,135,000	.25	1,506,000	.13	681,000	.25	1,339,000	.13	4,661,000	.18
13,8E	438,000	.26	864,000	.13	267,000	.26	512,000	.14	2,081,000	.18
	13,078,000	.26	13,221,000	.12	4,828,000	.25	4,841,000	.12	35,968,000	.19
		(.2579)		(.124)		(.2459)		(.120)		
Distribution %	36.4		36.8		13.4		13.4			

GEOLOGICALLY INFERRED RESERVES

Category	Tons Grade A	Est. MoS ₂ %	Tons Grade B	Est. MoS ₂ %	TOTAL TONS	Est. MoS ₂ %
Geologically Inferred	18,000,000	.25	18,000,000	.12	36,000,000	.185

ESTIMATED TOTAL RESERVES

Category	Tons Grade A (Ore)	MoS ₂ %	Tons Grade B (Sub-marginal)	MoS ₂ %	TOTAL TONS	MoS ₂ %
Possible	18,000,000	.25	18,000,000	.12	36,000,000	.19
Geologically Inferred	18,000,000	.25	18,000,000	.12	36,000,000	.185
	36,000,000	.25	36,000,000	.12	72,000,000	.19

TABLE II – CALCULATION OF MATERIALS RATIO

Section	1 Tons Waste	2 Tons Grade B (Sub-marginal)	3 Tons Grade A (Ore)	4 TONS TOTAL
9,6E	4,324,000	1,522,000	1,792,000	
10,0E	3,422,000	2,761,000	1,138,000	
11,4E	3,301,000	2,734,000	1,663,000	
12,2E	2,708,000	2,269,000	1,659,000	
12,6E	3,469,000	348,000	5,002,000	
13,0E	3,150,000	1,704,000	1,223,000	
13,4E	5,112,000	2,845,000	1,816,000	
13,8E	1,859,000	1,376,000	705,000	
	27,345,000	15,559,000	14,998,000	57,902,000
Add 10% for West end of pit:	2,734,000			
	30,079,000	15,559,000	14,998,000	60,636,000
Distribution %	49.6	25.7	24.7	100.00
Parts	2	1	1	4
Ratio (waste+B) to A = 3:1				

NOTE: above figures do not represent total amounts to be moved in the operation. They are derived from the most completely drilled sections, and are applied only to preliminary estimate of materials ratio.

BULK SAMPLING

In order to ascertain the true molybdenum content of representative portions of the deposit it will be necessary to implement a bulk sampling program.

It is our opinion that this sampling can be most effectively accomplished by opening two surface cuts at opposite ends of the deposit. For consideration we suggest the area of Block 6, Section 10,0E; and Blocks 1, 2 and 3, Section 13,0E.

These cuts can be opened up as small open pits in which not only bulk sampling can be conducted, but studies may be made of various methods of drill sampling, rock breaking and materials handling.

A considerable volume of material will have to be moved and a crushing and sampling plant installed. It is believed that approximately one-fifth

the total volume removed from any specific zone tested should pass through the sampling plant.

It will be advisable to erect a laboratory on the property and equip it for reduction and analysis of samples supplied from the bulk plant. Assay results being thus quickly available, control of materials movement will simulate full scale production methods.

If satisfactory correlation of drill hole sampling methods results from the test pit operations, several deep check holes might be drilled to obtain additional correlative data on grade and composition of the deposit below pit levels. These holes might be drilled by rotary open hole methods, with collected cuttings sampled for assay.

This Report is issued solely for the purpose of providing statistical information and is not a representation, prospectus or circular in respect to any security of this corporation. It is not submitted in connection with any exchange of or sale, or offer to sell or buy, any security now or hereafter to be issued.

